PACKET DATA COMMUNICATION DEVICE AND METHOD IN MOBILE COMMUNICATION SYSTEM

Abstract of WO0013426

A method for controlling channel access in a mobile communication system. A base station generates a broadcast channel frame, which includes status information indicating whether channel codes which are changing in real time are occupied or not. The base station transmits the broadcast channel frame at predetermined intervals. Then, a mobile station selects an available channel code based on information from the received broadcast channel frame, generates a channel assignment request message, and transmits the channel assignment request message on a random access channel. Upon reception of the channel assignment request message on the random access channel, the base station assigns a channel, sets a transmission rate, and transmits the information on a forward access channel.
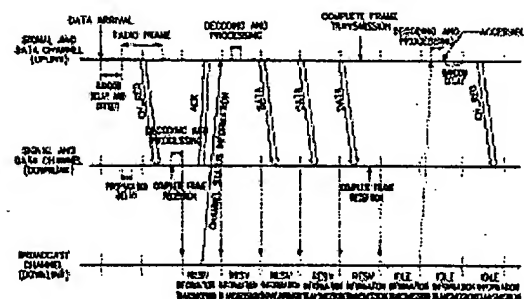
The next-generation mobile radio communication system should ensure efficient performance of the random access by the mobile station. To do so, the mobile radio communication system is required to minimize the time taken to receive an acknowledgment for an access request by reducing the access unit time, such as a time slot or a radio frame, and the amount of information transmitted during an access. An example is a MAC protocol such as DSA++ (Dynamic Slot Assignment) by which a channel access is attempted in mini-slots. Further, it is necessary to support as many random access channels as possible to minimize contention caused by concurrent access from a plurality of mobile stations.

Therefore, the channel access mechanism in the MAC protocol for radio multimedia service needs to increase a successful channel access rate by adding a reservation scheme to the conventional contention-based transmission scheme.

Further, to efficiently support the various Quality of Service (QoS) parameters required for multimedia traffic, radio channels should be dynamically managed. That is, a variety of traffics should be supported, such as CBR (Constant Bit Rate), RT-VBR (Real Time Variable Bit Rate), VBR, and ABR (Available Bit Rate) over an ATM (Asynchronous Transfer Mode) network. Since dynamically varied traffic such as VBR should be supported in real time, a MAC sublayer must efficiently manage radio resources without signaling overhead.

The conventional mobile communication system cannot support multimedia traffic with a transmission rate varied in real time because signal traffic should be additionally exchanged between layer-3 entities when a channel is to be additionally assigned during a service.

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A channel access mechanism in a MAC protocol for radio multimedia service should support both contention-based transmission and reservation-based transmission. The conventional mobile communication system uses a slotted- ALOHA mechanism to implement channel access. A mobile station competitively requests assignment of a random access channel, and a base station assigns the channel when the base station acknowledges the access. In this case, access performance for supporting radio multimedia service is determined by the number of random access channels and the number of signal messages transmitted. To reduce delay in random access transmission, the conventional mobile communication system uses a channel access of an offset period and a channel assignment message which a single radio frame can accommodate. On the assigned signal channel, information about the QoS required to provide the multimedia service is exchanged and a dedicated traffic channel which can accommodate it is assigned. However, an additional exchange of signal messages is required to assign a new channel in a line mode service on a dedicated traffic channel in the conventional mobile communication system. This channel assignment and release procedure is difficult to implement in real time because it is executed by a layer-3 entity such as Radio Bearer Control (RBC).

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a method of assigning a channel in consideration of service quality and minimizing access contentions in a MAC sublayer in order to support multimedia service having various traffic characteristics in a mobile communication system which provides a packet data service.

It is another object of the present invention to provide a method of dynamically controlling a transmission rate according to the amount of transmission

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data during a service of a mobile communication system which provides a packet data service.

It is a further method of transmitting status information required for random access on a specific channel by a base station in a mobile communication system.

It is still another object of the present invention to provide a device and method for minimizing during channel access by a mobile station in a mobile communication system.

It is yet another object of the present invention to provide a device and method for dynamically controlling the transmission rate depending on the amount of data transmitted during data transmission in a mobile communication system.

To achieve these and other objects, there is provided a method for controlling channel access in a mobile

communication system. A base station generates a broadcast channel frame, which includes status information indicating whether continuously changing channel codes are occupied or not, and transmits it at a predetermined interval. Then, a mobile station selects an available channel code based on information from the received broadcast channel frame, generates a channel assignment request message, and transmits the channel assignment request message on a random access channel. Upon reception of the channel assignment request message on the random access channel, the base station assigns a channel, sets a transmission rate, and transmits the information on a forward access channel.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which
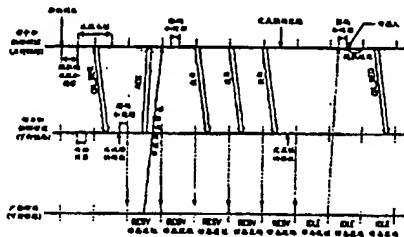
[12] 发明专利申请公开说明书

[54] 发明名称 移动通信系统中的分组数据通信装置和方法

[57] 摘要

　　一种用于在移动通信系统中控制信道接入的方法。基站产生包含指示是否占用正在实时改变的信道码的状态信息的广播信道帧。基站以预定的时间间隔发送该广播信道帧。然后,移动台根据接收到的广播信道帧中的信息,选择一个可用的信道码,产生信道分配请求消息,并在随机接入信道上发送该信道分配请求消息。基站一旦在随机接入信道上接收到信道分配请求消息,便分配信道,设置传输速率,并在前向接入信道上发送该信息。

接入时，由基站分配信道。这样，支持无线多媒体业务的接入性能就取决于随机接入信道的数量和传输的信号消息的数量。为减小随机接入发送的延迟，传统的移动通信系统使用具有偏移周期的接入信道和单个无线电帧能容纳的信道分配消息。提供多媒体业务所需的关于 QoS 的信息在分配的信号信道上

5 进行交换，并分配一个能容纳它的专用业务信道。然而，在传统的移动通信系统中的专用业务信道上的行模式(line mode)业务中，分配一个新的信道需要额外地交换信号消息。因为信道的分配和释放过程是通过象无线电承载控制(RBC， Radio Bearer Control)这样的第 3 层实体来执行的，所以信道的分配和释放过程很难实时进行。

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本发明的概要

因此，本发明的一个目的就是提供一种既考虑了业务质量，又使 MAC 子层中的接入争用最小化的分配信道的方法，以便在提供分组数据业务的移动通信系统中，支持具有各种业务特点的多媒体业务。

15 本发明的另一个目的是提供一种在提供分组数据业务的移动通信系统的服务期间，根据发送数据的量来动态地控制传输速率的方法。

它还是一种由移动通信系统中的基站在专用信道上发送随机接入所需的状态信息的方法。

本发明的另一个目的是提供一种在移动通信系统中，使移动台的信道接

20 入时间最小的装置和方法。

本发明的另一个目的是提供一种在移动通信系统中的数据发送期间，根据发送的数据量来动态地控制传输速率的装置和方法。

为实现上述及其它的目的，提供了一种用于在移动通信系统中控制信道接入的方法。基站产生广播信道帧，该广播信道帧包含了指示是否占用连续

25 变化的信道码的状态信息，并且，基站以预定的时间间隔将其发送出去。然后，移动台根据接收到的广播信道帧的信息来选择可用的信道码，并产生信道分配请求消息，然后在随机接入信道上发送该信道分配请求消息。基站一旦在随机接入信道上接收到信道分配请求消息，就分配信道，设定传输速率，并在前向接入信道上发送该信息。

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附图的简要说明

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